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ABSTRACT In laboratory tests no interrelation is observed between the tendency of a fuel to detonate in engines (octane value) and its tendency to ignite by incandescence. But in practical operation an increase of the octane value renders both the detonation and also the ignition by incandescence more difficult. The paper under review indicates some possible explanations of this contradiction. In this context, the author of the paper determined those temperatures of a heated surface which are necessary for the ignition if the temperatures and the compression pressures are changed within wide limits. Two values of the temperature of a plate were determined at certain unchanged initial conditions, namely T_1 - the temperature at the beginning of a regular ignition in each experiment (cycle) - and T_2 - the temperature corresponding to the complete cessation of the ignition. The difference between these two temperatures normally does not exceed 10°; the mean value of T_1 and T_2 was usually chosen as ignition temperature T_i. Then one of the parameters of the operating conditions was changed, and the new value of T_i was determined in the same way, etc.

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A diagram illustrates the obtained changes of the ignition temperature in dependence on the compression temperature for different fuels at unchanged compression pressure P_c = 8.25 ata and at α = 1. At lower T_c (550° K) the ignition temperatures of the different fuels fluctuate only within the limits of 1150 - 1200°, but at growing T_c these differences increase strongly. A second diagram illustrates the dependence $T_i = F(P_c)$. In this context, P_c denotes the compression pressure. This dependence is sufficiently similar to the dependence $T_i = f(T_c)$. Additional details and the fundamental mechanisms of these phenomena are discussed. The influence of the processes, which take place before the ignition, on the ignition temperature of a heated surface is a specific regulating factor that permits the ignition by moderately heated surfaces only at the very end of the combustion. 25X1
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